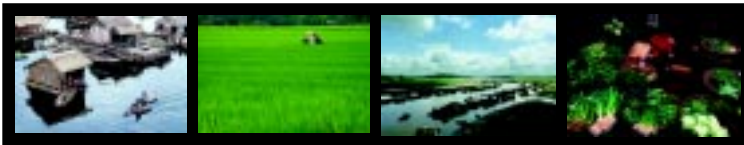


Vietnam Environment Monitor 2002



September 2002

The National Environment Agency, The World Bank and The Danish Agency for International Development (DANIDA) contributed to the preparation of this document. The World Bank task team consisted of Messrs./Mmes. Anjali Acharya, Patchamuthu Illangovan (Team Leader), Tran Thi Thanh Phuong and Anthony J. Whitten. NEA was represented by Messrs./Mmes. Truong Manh Tien (General-Director), Ho Van (Director of Monitoring Division), Hua Chien Thang (Deputy Director of Monitoring Division), and Tran Thi Le Anh (Monitoring Division). Mr. John Carstensen represented DANIDA. Consultants who assisted the Monitor team in providing environmental data and information included Nguyen Hoang Yen, Vu Thu Hanh, Nguyen Hong Thao, Nguyen Minh Son, Mai Ky Vinh, Nguyen Chu Hoi, Vu Xuan Nguyet Hong, Vu Van Tuan and Nat Pinnoi. Contributions and comments from Phan Thu Huong (MPI/DEA) and Zafer Ecevit, Chris Shaw and Ron Zweig (World Bank) are gratefully acknowledged. The document was peer reviewed by Todd M. Johnson of the Environment Department, World Bank and Dr. Nguyen Cong Thanh of Asian Institute Technology Center Vietnam (AITCV). Le Thanh Huong Giang provided logistics support. Ms Yok Dechamorn and Mr. Sorachai Nanthawatcharaviboon assisted in the layout and cover design. Jeffrey Lecksell was responsible for map design. Ms. Sirinun Maitriwatana coordinated the production of this document.

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The views expressed in the Vietnam Environment Monitor are entirely those of the authors. They do not necessarily reflect the views of the World Bank Group, its Executive Directors, or the countries they represent. The material contained herein has been obtained from sources believed reliable but it is not necessarily complete and cannot be fully guaranteed.

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The Government of Vietnam's 10 year National Environmental Protection Strategy (NSEP) recognizes that there is a rapid deterioration in environmental quality and natural resources. In the last 5 decades, natural forest cover has shrunk from 43 to 29 percent of land area, and the country is facing an acute shortage of arable land. Habitat loss has led to a rise in the number of threatened species. High rates of rural under-employment, also linked to land shortages, and an emphasis on industrialization, have contributed to migration to cities. Burgeoning urban populations are over-whelming municipal infrastructure and services and causing environmental problems such as unmanaged landfills, transport-related air pollution, untreated hospital and hazardous waste, and raw sewage flowing in open channels. Sedimentation, and point and non-point sources of pollution are threatening the health of rivers. Over-fishing and destruction of coral reefs and mangroves have reduced the fishing yield.

Over the last decade, Vietnam has put into place several environmental laws, decrees and ordinances addressing environmental protection, regulations. The challenge before the country now lies in the implementation of these laws and the formulation of sound environmental policies, for which accurate and reliable environmental data and information is critical.

Environmental data in Vietnam is collected by a variety of sources including government departments and agencies, academia and NGOs. Since 1994, the National Environment Agency has published State of the Environment reports based on monitoring data collected by the National Monitoring Network and DOSTEs. However, information sharing among organizations and access to information by the public is a major constraint to building a strong knowledge base for environmental management in the country.

There is an immediate need for systematic and coherent analysis of environmental data. The Vietnam Environment Monitor 2002 is a modest first step to address this gap by presenting a snapshot of key environmental trends in the country. Its purpose is to engage and inform stakeholders of key environmental changes as they occur, in an easy-to-understand format. Using charts and graphs, the Monitor benchmarks trends in various environmental indicators associated with green, blue and brown issues. Environmental changes, however, occur over a period of time, and therefore, unlike economic indicators, annual variations are not easy to measure or assess. Thus, the series is designed to track changes in general environmental trends every 5 years. In the intervening years, the Monitor will focus on specific themes, to highlight critical and emerging problems.

This Monitor consists of six sections. The first four sections describe environmental trends under the *Green, Blue, Brown* and *Global* agendas. An analysis of the institutions, legislation and budget is presented in a fifth section; and the Monitor concludes with an assessment of major challenges faced by Vietnam.

The Vietnam Environment Monitor 2002 is the outcome of a joint exercise involving national agencies, academia, civil society, and researchers. The information contained in this Monitor has been compiled from a variety of sources including published reports of various government agencies, universities, and nongovernmental organizations, and documents of the World Bank and bilateral donor agencies.

The National Environment Agency served as the lead government agency in the preparation of the Monitor, and provided data and coordinated the cooperation among government agencies. The Danish International Development Agency (DANIDA) supported the data collection, while the World Bank staff were responsible for data validation, analysis and writing of the report.

Dr. Pham Khoi Nguyen
Vice Minister
Minister of Science, Technology and
Environment

Klaus Rohland
Country Director - Vietnam,
East Asia and Pacific Region,
The World Bank

Zafer Ecevit
Sector Director,
Environment and Social Development Unit
East Asia and Pacific Region,
The World Bank

Børge H. Sørensen
Ambassador for Denmark in Vietnam

| | | | |
|--------------|---|---------------|---|
| ADB | Asian Development Bank | MoI | Ministry of Industry |
| BAP | Biodiversity Action Plan | MoPH | Ministry of Public Health |
| BOD | Biochemical Oxygen Demand | MoSTE | Ministry of Science, Technology and Environment |
| DLA | General Department of Land Administration | MoT | Ministry of Transport |
| DO | Dissolved Oxygen | MPA | Marine Protected Areas |
| DoSTE | Department of Science, Technology and Environment | MPI | Ministry of Planning and Investment |
| EEZ | Exclusive Economic Zone | MRC | Mekong River Commission |
| EIA | Environment Impact Assessment | NCNST | National Center for Natural Sciences and Technology |
| EPA | Environmental Protection Agency | NCSASR | National Committee for Search and Rescue |
| FIPI | Forest Inventory and Planning Institute | NEA | National Environment Agency |
| FPD | Forest Protection Department | NGO | Non-governmental Organization |
| GDLA | General Department of Land Administration | NMN | National Monitoring Network |
| GDMH | General Department of Meteorology and Hydrology | ODA | Official Development Assistance |
| GDP | Gross Domestic Product | ODS | Ozone Depleting Substances |
| GSO | General Statistical Office | SoE | State-owned Enterprises |
| HCMC | Ho Chi Minh City | SFE | State Forest Enterprise |
| IPM | Integrated Pest Management | SWM | Solid Waste Management |
| LWR | Law on Water Resources | TSP | Total Suspended Particulates |
| mha | million hectares | UNEP | United Nations Environment Program |
| MARD | Ministry of Agriculture & Rural Development | VND | Vietnamese Dong |
| MoC | Ministry of Construction | WB | World Bank |
| MoF | Ministry of Fisheries | WSC | Water Supply Companies |
| | | WHO | World Health Organization |

1US Dollar = 15,300 Vietnam Dong (Sept 1, 2002)



| Issue | Indicators | Trend |
|---|--|---|
| <i>Green Agenda</i> | | |
| Land degradation | <ul style="list-style-type: none"> Change in cultivated land area (%) Access to secure tenure (% of population)* Access to secure agricultural land tenure (% of farmer households) Access to secure forested land tenure (% of forest area) Change in fertilizer usage (%) | <ul style="list-style-type: none"> 38% increase, 1990-2000 not available 90.5 19 93% increase in imported fertilizers; 277% increase in local production |
| Declining forest cover | <ul style="list-style-type: none"> Forest area (as % of total land area)* Change in forest cover | <ul style="list-style-type: none"> 29.9 Increase from 9.3 mha in 1995 to 11.3 mha in 2000 |
| Loss of critical Habitats/biodiversity | <ul style="list-style-type: none"> Nationally protected area (% of total land area)* Number of protected areas management Boards | <ul style="list-style-type: none"> 6 65 management boards officially approved |
| <i>Blue Agenda</i> | | |
| Water supply falls short of demand | <ul style="list-style-type: none"> Access to an improved water source (% of population)* | <ul style="list-style-type: none"> 52.5 |
| Coastal and marine resources decline | <ul style="list-style-type: none"> Rate of increase in fisheries production Rate of increase in aquaculture | <ul style="list-style-type: none"> Doubling to 1.5 m tons from 1991-2001 153% increase between 1991-2001 |
| <i>Brown Agenda</i> | | |
| Declining water quality in surface and coastal waters | <ul style="list-style-type: none"> Access to improved sanitation (% of population)* | <ul style="list-style-type: none"> Sewerage coverage ranges from 20-60% in four large cities |
| Declining air quality in major cities | <ul style="list-style-type: none"> Increase in diesel consumption in transport sector Share of electricity generated by coal (%) | <ul style="list-style-type: none"> 103% increase between 1995-2001 12.4 |
| Increasing solid and hazardous waste generation and improper management | <ul style="list-style-type: none"> Solid waste generation rates % solid waste collected % solid waste recycled | <ul style="list-style-type: none"> 0.5-0.8 kg/person/day (large cities); 0.3-0.4 kg/person/day (small towns) 40-70% in big cities; 20-40% in small towns 13-15 |
| <i>Global Agenda</i> | | |
| Climate change | <ul style="list-style-type: none"> GDP per unit of energy use (PPP \$ per kg oil equivalent)* CO₂ emissions (metric tons per capita)* | <ul style="list-style-type: none"> 4.1 1.4 (1994) |

This scorecard represents an attempt to benchmark key environmental indicators. The selection of indicators was predicated on the availability of credible data, and also includes indicators for environmental sustainability identified under the Millennium Development Goals. The indicators selected here represent both production/consumption and deterioration/quality factors. This scorecard will be the basis to record future improvements or declines in environmental quality.

GREEN AGENDA: This is a term commonly used to describe environmental impacts caused by agriculture, deforestation, land conversion and destruction of protected species and related protection measures.

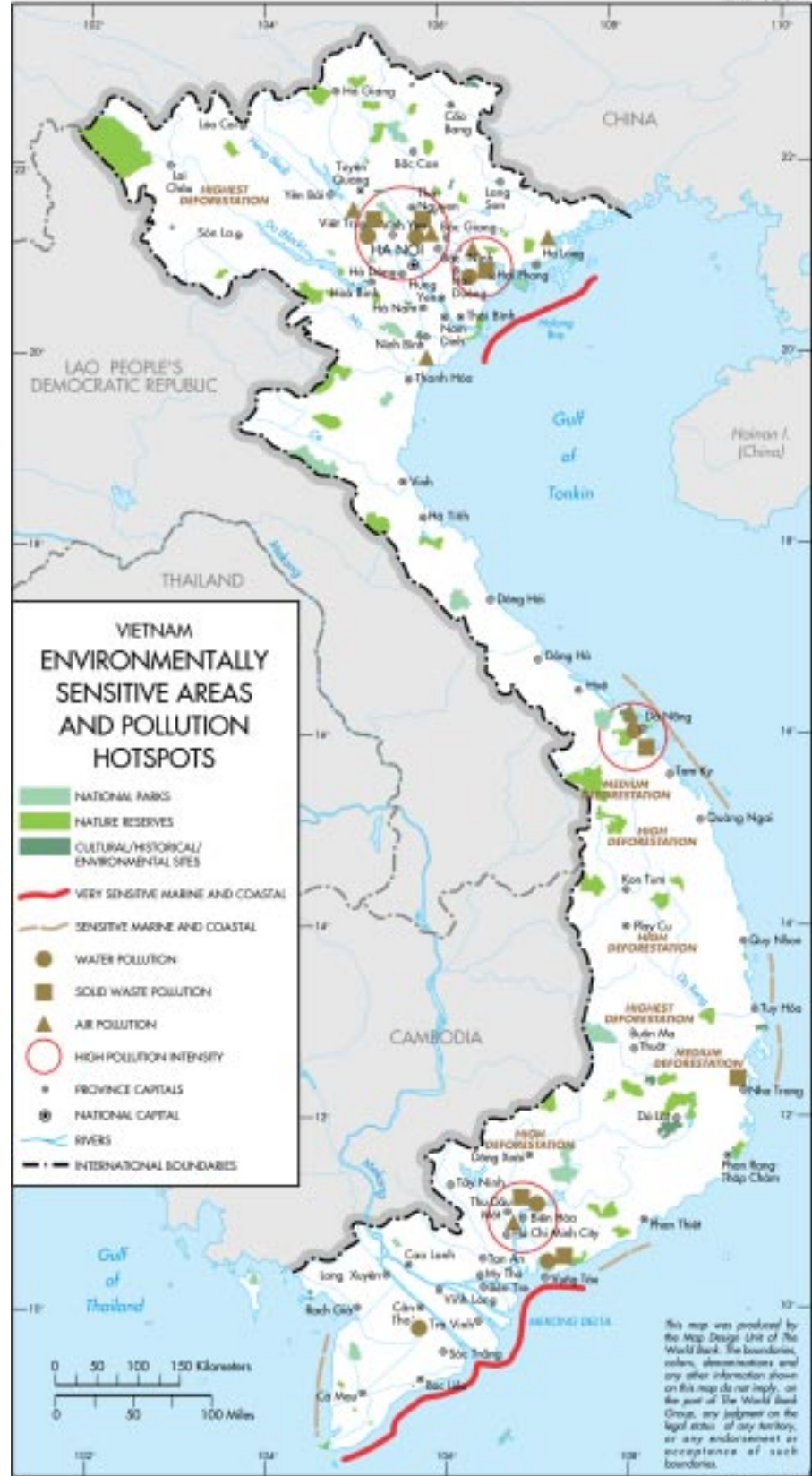
BLUE AGENDA: This term is commonly used to refer to all forms of water resources management.

BROWN AGENDA: This is a term commonly used to describe the pollution caused by industrial, urban, transport and energy sources and their single or collective impacts and protection measures.



ENVIRONMENTAL HOTSPOTS

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SEPTEMBER 2002

VIETNAM ENVIRONMENT MONITOR 2002



Green Agenda. Vietnam has a total land area of about 33 million hectares (mha), of which 25 mha comprises mountainous and hilly regions. Land degradation in Vietnam is caused by urbanization, insecure land tenure, poor logging practices, drought, salinization and acidification. Steep slopes and deforested landscapes, especially in the highlands and northwest regions, are very susceptible to soil erosion during heavy rains. Salinization and acidification are more severe in the Mekong delta region. The use of agrochemical inputs –chemical fertilizers and pesticides – are low, but steadily increasing. Pesticide usage has increased 200 percent over the last decade.

About 19 mha –58 percent of the country’s land area is classified as forest land. Of this, only about 11.3 mha is actually covered by forests –9.7 mha of natural forests and 1.6 mha of plantations. Despite recent increases in area, the quality of forests remains a concern. Closed canopy forests still make up only 13 percent, while poor/regenerating forests make up 55 percent of total forest area. Plantation forests, on the other hand, have more than doubled from 0.7 mha in 1990 to 1.6 mha in 2000.

Since 1999, logging operations by State Forest Enterprises (SFEs) have been curbed –only 130 SFEs are now permitted to manage natural forests for production purposes. Timber extraction from illegal logging is estimated at 0.5-2 million cubic meters annually. Fires –from dry weather conditions and shifting cultivation practices –are also destroying large sections of forests.

Vietnam is one of the world’s 10 most biologically diverse countries –containing about 10 percent of the world’s species, even while covering less than 1 percent of the earth’s surface. The high species diversity and endemism is under threat from habitat losses caused by population growth, dam and road construction, and agricultural expansion. Demand both from within Vietnam, and outside, fuels a major wildlife trade. To protect its biodiversity, Vietnam has developed a protected areas system –currently comprising 17 national parks, 58 nature reserves, and 18 protected landscape areas.

Blue Agenda. Several rivers traverse through Vietnam, providing an abundant supply of water (255 bcm annually). However, inadequate physical infrastructure and financial capacity results in a low utilization of only 53 bcm per year.

Annual rainfall of 1,960 mm, is uneven across Vietnam, and the dry season results in serious shortage of water in many areas.

The demand for water continues to escalate. Agricultural lands –accounting for 90 percent of water use–continue to expand. The rapid development of industry and the service sectors are also projected to increase demand for water in the future. Water supply falls short of demand in urban and rural areas due to inadequate infrastructure and confusing jurisdictional responsibilities. In 2000, only 52.5 percent of Vietnam’s population of 78 million had access to safe water, and only 24 percent of households had piped water facilities.

Vietnam’s rich and diverse coastal and marine ecosystems are also under threat. Over the last five decades, Vietnam has lost more than 80 percent of its mangrove forests –with shrimp farming one of the leading causes for this destruction. About 96 percent of Vietnam’s coral reefs are severely threatened by human activities, including destructive fishing methods, over-fishing, and pollution. Over the last decade, the marine catch has doubled to 1.5 million tons in 2001. However, the overall catch per unit effort has steadily declined over the same period, accompanied by a shift to smaller fish catch size. Aquaculture yields, on the other hand, have increased.

Brown Agenda. Wastewater and run-off from urban areas, industrial centers, and agricultural land, pollute surface, ground, and coastal waters of Vietnam. Untreated sewage from households, effluents from industrial enterprises and seepage from garbage dumps or landfills are the main causes of organic pollution of surface water. Ninety percent of the enterprises established prior to 1995 have no wastewater treatment facilities, and use obsolete equipment.

Trends in the country’s 9 river basins indicate good upstream water quality, while downstream sections are often polluted. Organic pollution gets worse in the dry season, when flows in rivers are reduced. Within cities, lakes, streams, and canals increasingly serve as sinks for domestic sewage and industrial wastes. Groundwater quality is showing some contamination. Rapid urbanization and industrialization in the interior, port and marine transport development, expansion in coastal tourism, and rise in oil spills contribute to the deterioration of coastal water quality

Air quality in nearly all urban and industrial areas is affected by particulates, lead and nitrous oxides, sulfur dioxide and carbon monoxide emitted by sources including vehicles, factories, power plants, and households. Fine particulates (PM₁₀) are an emerging problem in urban areas. Sulfur dioxide emissions near some factories occasionally exceed the standard by several fold. Lead levels at major traffic intersections in main cities are starting to decline following the government's decision to ban leaded gasoline.

Waste generation is on the rise –ranging from 0.5-0.8 kg/person/day for large cities and 0.3-0.4 kg/person/day for small towns. Household collection efficiencies remain low (national average of 53.4 percent), while recycling is modest at 13-15 percent. Most of the collected waste in Vietnam is disposed in dumps and open landfills, and there is no separate treatment for hazardous wastes.

Global Agenda. Vietnam is a party to many major international environmental conventions on transboundary and global issues, including biodiversity, ozone depletion, climate change, transportation of hazardous, oil spills and trade in endangered species of wild fauna and flora.

Environmental Management. Vietnam has put in place a sound legal framework for environmental protection and natural resources conservation which include many laws, regulations, and directives. The national environmental law was enacted in 1993. The Ministry of Science, Technology and Environment is responsible for environmental protection while the Ministry of Agriculture and Rural Development (MARD) oversees forest management and biodiversity

conservation. In all, there are 10 ministries, 15 committees and general departments, and several local-level agencies, whose actions influence the environment. These ministries and agencies are highly segmented with limited cooperation among them. A preliminary review of staffing of these ministries and departments indicates inadequate capacity and over-extended staff.

The budget structure of Vietnam's public sector expenditure does not allow for exact determination of environmental spending. A preliminary analysis indicates that core environmental expenditure hovers just under 1 percent of the total public spending.

Challenges. To achieve the vision formulated in the National Environmental Strategy and Action Plan (2001-2010), the country needs to address the four challenges articulated in the Vietnam Development Report 2000:

- *creating incentives for changing behavior*
- *involving communities and citizens more fully*
- *improving institutional effectiveness*
- *diversifying sources of financing for implementing priority programs*

At the core of tackling these challenges is the quality of data and their timely analysis, so that policy responses can be designed cost-effectively with broad consensus. Improving data collection and storage methods, systematizing analysis and enhancing accuracy, sharing information, and strengthening capacity would provide Vietnam with the required tools to better formulate, implement, and refine its environmental policies.



Vietnam has a total land area of about 33 million hectares (mha), of which 25 mha comprises mountainous and hilly regions. Agricultural land accounts for about 9.3 mha (or 28.4 percent). Great increases in agricultural production have been achieved in recent years, with Vietnam now the world's second largest rice exporter. It is also the fifth most densely-populated agricultural country (where more than 30 percent of GDP is derived from agriculture) after Bangladesh, India, Rwanda, and Burundi.

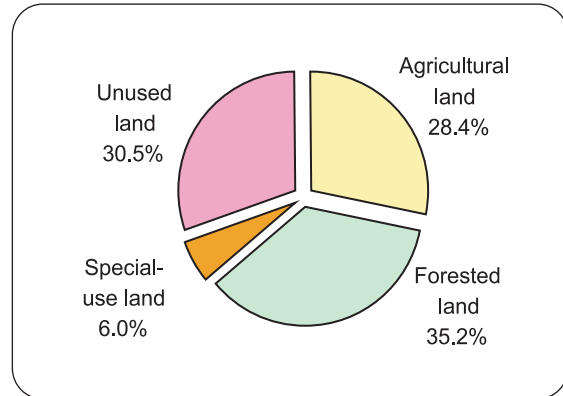
Over the past decade, the area of *cultivated land* in Vietnam has steadily increased from 9 mha to almost 12.5 mha. This 38 percent increase is mostly attributed to the expanding cultivation of perennial crops such as coffee, rubber, and tea. However, cultivated land per capita has declined over the same period.

Forested land comprised almost 11.3 mha of which different grades and qualities of natural forests covered just about 9.7 mha. Residential and other minor categories accounted for an additional 1.5 mha. About 10 mha (31 percent) of the country's land –most of this steep slopes – remains 'unused'.

Land degradation in Vietnam can be attributed to a variety of causes including urbanization, insecure land tenure, poor logging practices, drought, expansion of aquaculture into areas of acid sulphate prone soils, and acidification. About 50 percent of Vietnam's land area has been identified as having poor quality soils as a result of human activity.

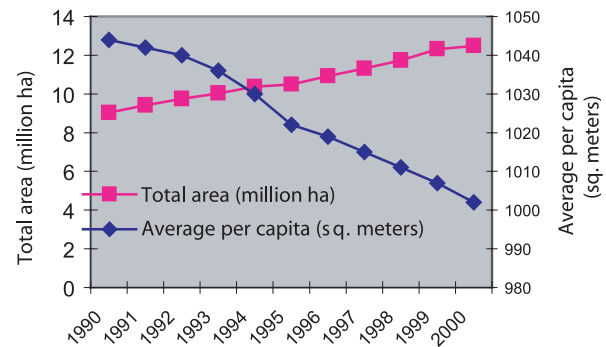
Soil erosion ...Vietnam's many steep slopes and deforested landscapes, especially in the highlands and northwest regions, are very susceptible to soil erosion during heavy rains. The eroded topsoil is carried away and deposited as silt in rivers, lakes and estuaries, and the rich diversity of productivity-enhancing organisms is lost. Potential soil erosion ranging from 50-3200 ton/ha/year affects about 23 mha, accounting for some 70 percent of the country's land area.

Fig. 1: Land Use, 2000



Source: GSO, 2001

Fig. 2 : Cultivated land area, and cultivated area per capita 1990-2000



Source: GSO, 2001

Table 1 : Potential soil erosion in Vietnam

| Erosion class | Potential erosion intensity (T/ha/year) | Area of potential classes (ha) | Percentage of the whole country (%) |
|---------------|---|--------------------------------|-------------------------------------|
| 1 | < 50 | 10,081,000 | 30.6 |
| 2 | 50 – 100 | 1,984,000 | 6.0 |
| 3 | 100 – 200 | 3,149,000 | 9.6 |
| 4 | 200 – 400 | 4,811,000 | 14.6 |
| 5 | 400 – 800 | 6,815,000 | 20.7 |
| 6 | 800 – 1600 | 5,022,000 | 15.2 |
| 7 | 1600 – 3200 | 1,088,000 | 3.3 |
| 8 | 3200 – 4500 | 47,000 | 0.1 |
| 9 | > 4500 | 30,000 | 0.0 |

Source: Tran Van Y, Nguyen Quang My, Nguyen Van Nhung, 1999